

## Analysis of Viral Load in Patients with HIV and Patients with HIV/TB

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**Abstract:** Among people living with the human immunodeficiency virus (HIV), tuberculosis (TB) is the most common concomitant disease and the leading cause of mortality. HIV-positive test results for confirmed TB patients increased from 58 percent in 2016 to 60 percent in 2017.

**Key words:** HIV, Tuberculosis, viral load

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Among people living with the human immunodeficiency virus (HIV), tuberculosis (TB) is the most common concomitant disease and the leading cause of mortality. HIV test results for confirmed TB patients increased from 58 percent in 2016 to 60 percent in 2017. The most common cause of death worldwide from a single infectious disease agent is tuberculosis infection, which is made worse by antibiotic resistance. It is also a major cause of death in people with HIV [12]. An estimated 10 million new cases of TB were reported in 2018, with 1.5 million deaths [1]. The majority of TB patients live in low- and middle-income countries. The continent of Africa follows South-East Asia in having the greatest percentage of newly diagnosed TB patients (44% and 24% of new cases respectively) [2]. The number of TB-related deaths is increasing in low and middle income nations as the epidemic expands.

People who have TB over time suffer from both physical and mental health negative effects. It is a long-term or temporary handicap brought on by the chronic condition. A compound of drugs are used to treat TB for at least 6 months, and they are administered in two phases: the intensive DOTS (Directly observed therapy short course) phase and the extended phase [3]. When signs of the disorder start to manifest, patients may feel rejected or discriminated against, which lowers their self-esteem. Patients may experience financial difficulty as a result of losing their jobs or other sources of income. In Uzbekistan TB treatment is free, which lessens the patient's financial burden and hastens their

recovery. Patients may experience social rejection or stigmatization as their disease's symptoms become more pronounced, which can lower their self-esteem. Patient may also encounter financial troubles and lose their employment or other sources of income [4].

**Purpose.** To assess viral load in patients with HIV and patients with HIV/TB.

### Methodology.

Research design: cross-sectional study.

The Republican Center based research was carried out from March to October 2022 in the Republican AIDS Centre of Uzbekistan (Tashkent). Considering isolation and contagiousness of patients who were during the intensive care phase of the treatment were not included into the study. The research population included 41 HIV-positive TB patients and 67 HIV-positive patients aged 15-19 years (overall 108). Informed consent was obtained from each participant (for patients aged below 18 informed consent obtained from their parents or caregivers). Every patient/parents/caregiver had the opportunity to refuse participation in the research at any time.

Data of all the completed questionnaires were included into the excel spreadsheet and were analyzed utilizing the Statistical Package for the Social Sciences (SPSS) (version 28.0). Those p-values less than 0.05 were considered statistically significant.

Process of the data collection was as follows:

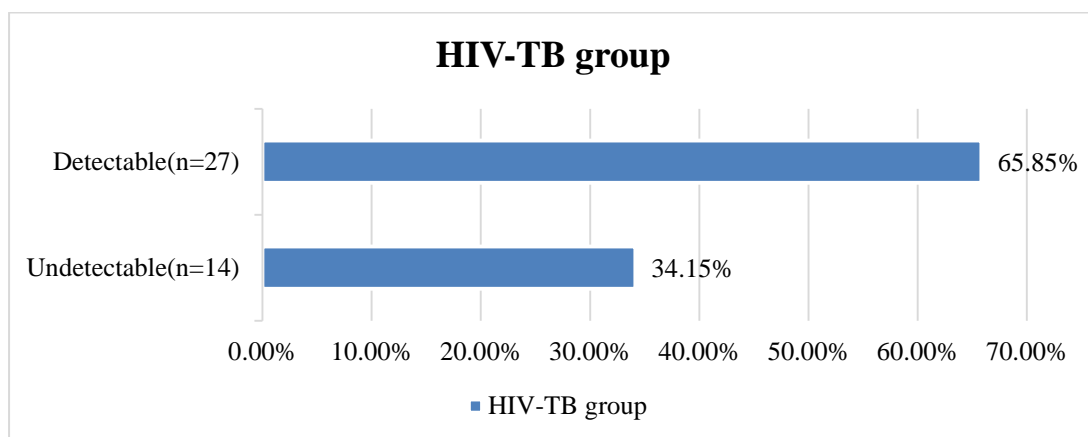
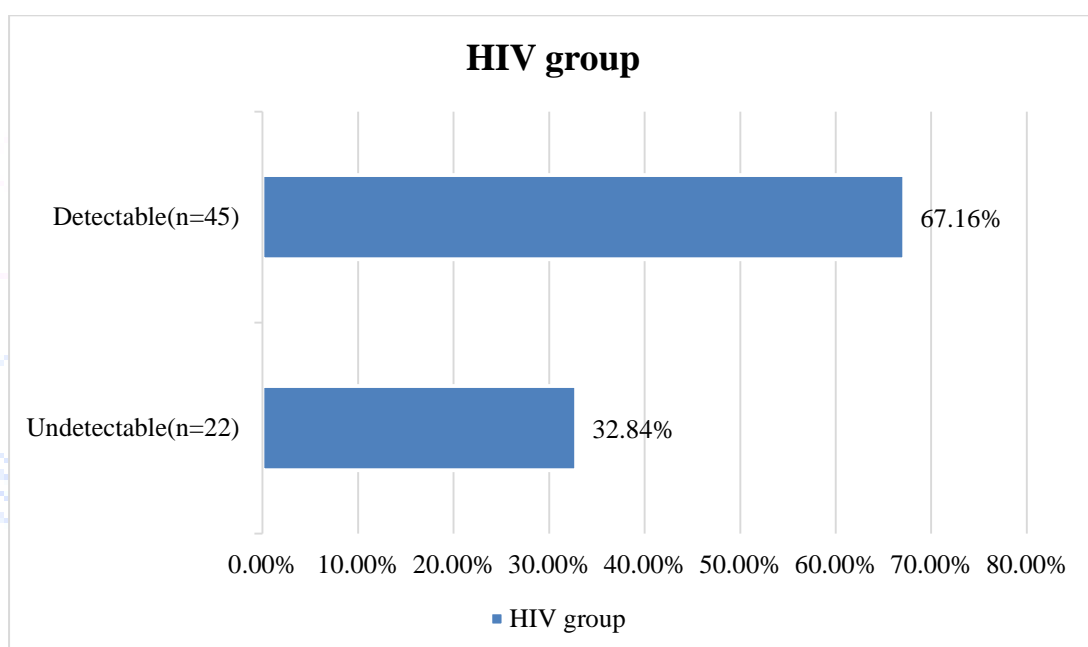
1. During a visit to the infectious disease physician, patient or patient's parent was offered to take participation in the research. The aims and objective of the research were shortly explained and informed consent form offered to be signed off.
2. Medical Record of each patient was observed to obtain clinical laboratory data. The research used quantitative method based on primary data collection.

### Results

- Detectability of HIV in serum in the participants of both groups. The illustration shows that only about a third of the main and control groups had undetectable viral load (Table 1) (Graph 1-2). Whereas, the Joint United Nations Program on HIV/AIDS aims for viral suppression rates to be 95%-95%-95% by 2025 (2025 AIDS targets, 2021).

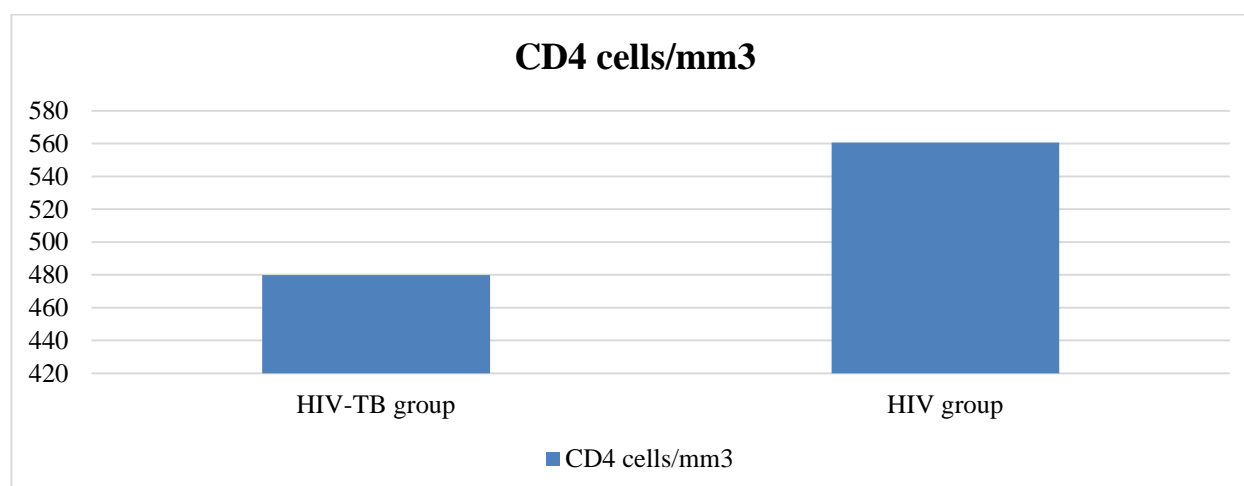
**Table 1. Viral load in HIV-TB and HIV groups**

Crosstab				
Count				
		(1) HIV and TB; (2) HIV		Total
		1	2	
Detectable -1/undetectable-2	1	27	45	72
	2	14	22	36
Total		41	67	108

**Graph 1. Virus detectability in the main group****Graph 2. Virus detectability in the control group**

- Comparison of the state of immune system of patients in two groups (comparing average CD4 counts)

In comparison with the control group HIV-TB group had less average CD4 cell count (480 cells per  $\text{mm}^3$  serum in the main group). Whereas, mean count of CD4 cells in the control group was 540 cells per  $\text{mm}^3$  serum) (Graph 3).

Graph 3. Average CD4 counts (cells/mm<sup>3</sup>) in both groups

### Discussion

The study's gender distribution in the main study group was as followings: males (n=29; 70.73%) and females (n=12; 29.27%). That was consistent with other study showing that male patients had a higher prevalence of TB than women [5,6]. In the control group male respondents (n=39; 58.20%) represented slightly more than a half of the whole population. 41.80% of the HIV group were female respondents. Contrary to a research [8], where women's scores were considerably higher than men's on pain intensity, pain anxiety and role functioning, our investigation revealed that women had almost the same ratings on those domains as male participants.

Mamani and co-authors [9] found that the TB patients' ratings were lower across the all the components than those of the control group, while another found that the general scores for physical and mental health were 42.5 and 40.7, respectively. The lowest sub-scale scores were for emotional role, physical pain and general health, while the highest domain scores were for mental health, fatigue and energy [10].

According to our findings, patients with HIV and TB reported the lowest score (41.78) in the domain General health perception and recorded the highest score (81.47) in the subscale Bodily pain. Different results were observed in a research conducted in the Islamic Republic of Iran [11] using the SF-36 questionnaire, which showed that role limitations brought on by emotional issues received the lowest score, while overall health perception received the greatest score.

The limitations because of emotional issues may be caused by the fact that most patients struggled to accept their medical condition and as a result had a lower self-perception or esteem of themselves, or it may be caused by the fact that they experienced physical pain or / and found it harder than usual to complete most routine tasks [12].

### Conclusion

Only about a third of the main and control groups had undetectable viral load (Graph 1-2). But the Joint United Nations Program on HIV/AIDS aims for viral suppression rates to be 95%-95%-95% by 2025. Both male and female participants suffered equally from bodily pain, emotional wellbeing, limitations due to emotional problems and physical health, physical functioning. TB status was the main factor affecting the quality of life in HIV-TB patients in this study.

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